

**REMARKS**

The Office Action indicated that the subject matter of Claims 25 and 26 would be allowed if written in independent form. Applicant respectfully requests that the revision of these claims be held in abeyance until the following comments have been considered.

The Office Action rejected each of the outstanding claims as being unpatentable over the *Nishimura et al.* (Japanese Patent Publication No. 11-250804). The Office Action relied upon U.S. counterpart of *Nishimura et al.* (U.S. Patent No. 6,309,272) for a citation of the teachings.

The Office Action acknowledged that the *Nishimura et al.* reference was not directed to a method of forming a plasma display panel, but rather was directed to a surface conductive-type electron emission device wherein the electron emitting section to produce a stream of electrons is formed by a conductive thin film specially heat treated to produce highly resistant cracks that can contain carbon or carbonaceous material. See Column 6, Lines 10-19.

In operation, the electron emission device was evacuated to a high degree of vacuum and subject to a getter treatment to maintain the high vacuum to thereby permit the accelerated electron beams emitted from the electron emitting section to be accelerated by a high voltage of 4,000 volts to collide with fluorescent film. Presumably, the atoms of the fluorescent film has the capacity to be excited to raise its valence level, and upon returning to a lower state, to emit directly visible light.

A careful review of the teachings of the *Nishimura et al.* reference simply indicates that a color fluorescence substance is applied by a slurry coating process to form a fluorescent film, and the inner surface of this film is subject to a smoothing (filming) processes so that aluminum can be deposited on the smooth surface by a vacuum deposition process to form a metal back layer. See Column 17, Lines 42-55.

See also the teaching in Column 18, Lines 36-40, which states as follows:

... and the emitted electronic beams were accelerated by a high voltage of 4 kV applied to the metal back layer through the high-voltage terminal Hv. The accelerated electronic beams collided with the fluorescent film 84 to form a fluorescent image.

It would thus appear that the thin film field emission cathodes have characteristics similar to a cathode ray tube and are certainly not analogous to a plasma discharge panel. In a plasma discharge panel, an elevated charging pressure of a discharge gas such as Ne-Xe gas is provided so that an appropriate excitation of a plasma will produce ultraviolet rays to excite blue, green, or red phosphor material to emit visible light. The particular phosphorous material must be selected specifically for a plasma display panel, and as a feature of our manufacturing process, we insure that there is not a deterioration of the phosphorous layers, and particularly the blue phosphorous, as set forth in our dependent claims.

The application of a dry gas containing oxygen in the baking step wherein the organic binder in the phosphorous layer is released can address the potential deterioration of, for example, the blue phosphorous layer. The present invention provides a method of producing plasma display panels having a high light-emitting efficiency and color purity while specifically preventing the phosphorous layer from being deteriorated due to heat during the production process.

Thus, independent Claims 1 and 16 are specifically directed to a plasma display panel wherein a pre-baking step of the phosphorous layer is performed with the phosphorous containing an organic binder. A sealing material applying step applies a sealing material that will soften with heat on the peripheral region of the front and back substrates that are to face each other and a stacking step can be utilized to position the front and back substrates in a stack-

like configuration. A baking step heats both the front and back substrates to specifically burn out the organic binder while supplying a dry gas containing oxygen in the internal space formed between the front and back substrates.

As noted in the baking step of Claim 16, the organic binder is burned out in a furnace while the surfaces of the front and back substrates are positioned to face each other and are separated from each other to provide enough space to allow gases to escape. Subsequently a bonding step is provided to contact the sealing material for bonding the front and back substrates by keeping the front and back substrates at a temperature higher than the softening point of the sealing material.

By complying with the teachings of the present invention as set forth in our claims, a relatively efficient and low power consumption production method is provided while preventing the phosphorous layers from being deteriorated due to heat and thereby providing a high light emitting efficiency and color purity to the resulting product.

The production of plasma display panels has been subject to intense work by highly skilled scientists and engineers in an effort to improve not only performance, but to make the products cost competitive. As such, a person of ordinary skill in this field would not resort to basically a non-analogous teaching of an electron emission device using apparently a different form of phosphorous material excited directly by a stream of highly accelerated electrons in a vacuum. The *Nishimura et al.* reference does not even mention the materials of the fluorescent layer and describes, as mentioned above, a technique of apparently manufacturing the fluorescent substance with a slurry coating process with aluminum being deposited in a vacuum deposition process directly on a smoothed or filming surface. The specifics of curing, if any, and any

procedures to prevent any deterioration of the fluorescence film are neither addressed nor mentioned in the teachings of the *Nishimura et al.* reference.

The field of plasma display panels and their manufacturing methods are in a crowded field so that advances in this art must accordingly be weighed against the highly competitive nature of this type of product.

Thus when differences that may appear technologically minor nonetheless have a practical impact, particularly in a crowded field, the decision-maker must consider the obviousness of the new structure in this light.

*Continental Can Co. USA Inc. v. Monsanto Co.*,  
20 USPQ 2d 1746, 1752 (Fed Cir. 1991).

The present rejection does not address the specific features set forth, for example, in independent Claims 1 and 16, let alone the additional distinguishing features in the dependent claims, other than Claims 25 and 26. Since the *Nishimura et al.* reference is not even in an analogous field and is clearly lacking in recognizing the problems addressed and solved by the present invention, it would appear that only hindsight can be used from our own specification in which to even cite the *Nishimura et al.* reference. It is respectfully submitted that there is no objective teaching in the cited prior art that would render obvious our present claims.

Examining specifically the basis for the present rejection, the Office Action repetitively states, for example, on page 3:

Still, it would have been obvious to one with ordinary skill in the art at the time the invention was made to use the method of Nishimura to make a plasma display panel in order to provide the plasma display panel with sufficient high luminance.

It is respectfully submitted that the Federal Court of Appeal's recent decision in the case of *In Re Sang Su Lee*, 277 F.3d 1338 (Fed. Cir. 2002), copy attached, rejected this manner of forming a rejection. Thus, it is respectfully submitted that the *Nishimura et al.* reference cannot

be relied upon as a teaching reference, and that the evidence of record in this case is insufficient to support the 35 U.S.C. § 103 rejection.

Additionally, the Office Action further admits that the features set forth in dependent claims, such as Claims 3, 7-9 and 19-20, are neither taught nor suggested, and alleges that such conditions would only be of routine skill in the art, citing an old case of *In re Aller*. Again, it is respectfully submitted that the recent decision from the Federal Court of Appeals in the *Lee* case, *supra*, provides the proper guidelines that should be applied relative to our presently pending claims.

Referring to the summary of our invention, at Page 6, Line 17, through Page 7, Line 11, issues addressed and never contemplated nor resolved by the *Nishimura et al.* reference can be found as follows:

Meanwhile, the phosphor baking process and the bonding process may be performed simultaneously by a method in which first the phosphors and sealing material are applied to one of surfaces of the front and back substrates that are to face each other, then the front and back substrates are disposed to face each other and heated.

When, however, the phosphors are baked while the front and back substrates are disposed to face each other, gases (water or the like) adsorbed on the surfaces of the substrates are released with heat and burning gases are generated, and these gases fill each narrow internal space. When this happens, deterioration of the phosphors by heat and quality change of MgO tend to happen since the phosphors and the protecting layer composed of MgO are exposed to high-temperature, high-density gases. Also, oxygen required for the burnout tends to be short. When this happens, remains of burned organic substances may be left, or MgO or the phosphors that lack oxygen may be generated. This results in decrease in discharge characteristics or light-emitting efficiency of the phosphors. Especially, chromaticity of the blue phosphors tends to be deteriorated by the heat.

The *Nishimura et al.* reference refers to a method of making a cold-cathode electron emission device wherein a thin film is basically heat deformed or destroyed to create a high resistance electron emitting section that is subsequently coated with a carbon material. The application of any sealing material and its subsequent calcination is done separate and apart from the actual formation of the electron emitting section. In fact, as seen in Figure 15, the formation of the electron emitting section can be in essence the last step in the formation of the product. In each of the embodiments, it is at least a separate and independent step that does not address the application of the frit material. The broad statement of using a fluorescence substance certainly does not recognize a problem of preventing the phosphorous layer, and particularly the blue phosphorous layer, from being deteriorated.

The Office Action specifically contends that the *Nishimura et al.* reference teaches supplying a dry gas containing oxygen by referring to Column 11, Line 32, through Column 12, Line 26. This teaching, however, is directed to the separate step of depositing a frit glass with a binder and the application of a calcination step which is performed at a temperature lower than the softening point of the glass, but higher than the pyrolytic temperature of the binder. The units are connected together, and it is further indicated that the electron source substrate can be exposed to an evolved gas such as methane for depositing carbon. The actual formation of the conductive thin film or electron emitting section occurs after the calcination step, and there is no teaching of a dry gas containing oxygen in the cited material, let alone a dry gas containing oxygen to address the demands of a phosphorous layer.

Likewise, the citation of Column 19, Line 29, through Column 20, Line 55, does not render obvious the present invention, nor does it support the present rejection. The only apparent teaching is that the calcination and the sealing are conducted at two different temperatures at ten

minutes each in atmosphere. There is no discussion of removing any organic binder in a pre-baking step from a phosphorous layer nor any effort to preserve the characteristics of a phosphorous layer. In fact, the fluorescence layer is never mentioned nor addressed in the cited portions of the specification.

The newly drafted dependent Claims 38 and 39 define that the operation of organic burnout can be incurred in one operation of raising and lowering the temperature while the substrates are bounded together by the softening sealing material. This procedure reduces the time and energy required for preproduction of the plasma display panel and also reduces the number of times that the phosphorous layers are exposed to a heat that can cause deterioration.

Since the *Nishimura et al.* reference does not address nor recognize any problems with a fluorescence layer that is activated by a stream of highly charged electrons, it certainly does not recognize or teach the advantages of the method steps of the present invention in addressing the problems of deterioration of phosphorous layers in a plasma display panel.

It is believed that the case is now in condition for allowance and an early notification is requested.

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If the Examiner believes that a telephone interview will help further the prosecution of this case, he is respectfully requested to contact the undersigned attorney at the listed telephone number.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on February 20, 2004.

By: Marc Fregoso

Marc Fregoso

Signature

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Very truly yours,

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